WHAT IS CLAIMED IS:

1. An apparatus for processing telecommunication signals, the apparatus being adapted to perform a frame classification process and a rate determination process associated with a bitstream representing one or more frames of data encoded according to a first voice compression standard from a bitstream representing one or more frames of data according to a second compression standard or associated with a bitstream representing one or more frames of data encoded according to a first mode to a bitstream representing one or more frames of data according to a second mode within a single voice compression standard, the apparatus comprising:

a source bitstream unpacker, the source bitstream unpacker being adapted to separate a voice code from a source codec into one or more separate codes representing one or more speech parameters and being adapted to generate one or more parameters for input into the frame classification and rate determination process;

more than one parameters buffers coupled to the source bitstream unpacker, the one or more parameters buffers being adapted to store the one or more input parameters and one or more output parameters of the frame classification and rate determination process from the one or more bitstream frames;

a frame classification and rate determination module coupled to the more than one parameters buffers, the frame classification and rate determination module being adapted to input one or more of selected classification input parameters, the frame classification and rate determination module being adapted to output a frame class, a rate decision and one or more classification feature parameters.

2. The apparatus of claim 1 wherein the source bitstream unpacker comprises:

a code separator, the code separator being adapted to receive an input from a bitstream frame of data encoded according to a voice compression standard and being adapted to separates one or more indices representing one or more speech compression parameters;

single or multiple unquantizer modules coupled to the code separator, the single or multiple unquantizer modules being adapted to unquantize one or more codes of each of the speech compression parameters; and

a classifier input parameter selector coupled to the single or multiple unquantizer modules, the classifier input parameter selected being adapted to selects one or more inputs used in a classification process.

3. The apparatus of claim 1 wherein the source bitstream unpacker comprise a single module or multiple modules.

4. The apparatus of claim 1 wherein the more than one parameter buffers comprise:

an input parameter buffer, the input parameter buffer being adapted to store one or more of the input parameters of one or more of the frames for the frame classification and rate determination module;

an output parameter buffer coupled to the input parameter buffer, the output parameter buffer being adapted to store the output parameters of one or more of the frames for the frame classification and rate determination module;

more than one intermediate data buffers coupled to the output parameter buffer, the more than one intermediate data buffers being adapted to store one or more states of a sub-classifier; and

more than one command buffers coupled to the more than one intermediate data buffers, the more than one command buffers being adapted to store one or more external control signals of one or more of the frames.

5. The apparatus of claim 1 wherein the frame classification and rate determination module comprises:

a classifier comprising one or more feature sub-classifiers, the one or more feature sub-classifiers being adapted to perform prediction and/or classification of a particular feature or a pattern classification, and

a final decision module coupled to the one or more feature sub-classifiers, the final decision module being adapted to receive one or more outputs of each of the one or more multiple feature sub-classifiers input and output parameters and external control signals, the final decision module being adapted to output one or more final results of the frame class, the rate decision and one or more predicted values of one or more of the classification features, the one or more predicted values being associated with an encoding process of a destination codec.

6. The apparatus of claim 1 wherein the frame classification and rate determination module is a single module or multiple modules.

7. The apparatus of claim 1 where the source codec comprise its bitstream information, the bit stream information including pitch gains, fixed codebook gains, and/or spectral shape parameters.

8. The apparatus of claim 1 where the second mode is associated with a single voice compression standard, the single voice compression standard is characterized as a variable rate codec , whereupon the one or more parameters for inputs is associated with a selection of a transmission data rate.

9. The apparatus of claim 1 where the second mode is associated with a single voice compression standard, the single voice compression standard causes classification of the bitstream representing one or more frames of data encoded.

10. The apparatus of claim 5 wherein the one or more feature sub-classifiers comprise a plurality of pre-installed coefficients, the pre-installed coefficients being maintained in memory.

11. The apparatus of claim 5 wherein the one or more feature sub-classifiers can be adapted based on the second mode and on or more external command signals.

12. An apparatus as in claim 5, wherein each of the one or more feature sub-classifiers being adapted to receive an input of selected classification input parameters, past selected classification input parameters, past output parameters, and selected outputs of the other sub-classifiers.

13. An apparatus as in claim 5, wherein each of the one or more feature sub-classifiers that determines the class or value of a feature which contributes to one or more of the final decision outputs of the frame classification and rate determination module may take the structure of a different classification process.

14. An apparatus as in claim 5, wherein one of the feature sub-classifiers that determines the class or value of a feature which contributes to one or more of the final

decision outputs of the frame classification and rate determination module may be an artificial neural network Multi-Layer Perceptron Classifier.

15. An apparatus as in claim 5, wherein one of the feature sub-classifiers that determines the class or value of a feature which contributes to one or more of the final decision outputs of the frame classification and rate determination module may be a decision tree classifier.

16. An apparatus as in claim 5, wherein one of the feature sub-classifiers that determines the class or value of a feature which contributes to one or more of the final decision outputs of the frame classification and rate determination module may be a rule-based model classifier.

17. An apparatus as in claim 5, wherein the final decision module enforces the rate, class and classification feature parameter limitations of the destination codec, so as not to allow illegal rate transitions from frame to frame or so as not to allow a conflicting combination of rate, class, and classification feature parameters within the current frame.

18. An apparatus as in claim 5, wherein the final decision module may favor preferred rate and class combinations based on the source and destination codec combination in order to improve the quality of the synthesized speech, or to reduce computational complexity, or to otherwise gain a performance

19. The apparatus of claim 10 wherein the pre-installed coefficients in the one of more feature sub-classifiers are data types from logical relationships, decision tree, decision rules, weights of artificial neural networks, numerical coefficient data in analytical formula and others depending on the structure and classification or prediction technique of the sub-classifier.

20. The apparatus of claim 10 wherein the pre-installed coefficients in feature sub-classifiers can be mixed data types of logical relationships, decision tree, decision rules, weights of artificial neural networks, numerical coefficient data in analytical formula and others when more than one classification or prediction structure is used for the feature sub-classifiers.

21. The apparatus of claim 10 wherein the pre-installed coefficients in the feature sub-classifiers are derived from a classification construction module.

22. The apparatus of claim 21 wherein the classifier construction module comprises

a training set generation module;

a classifier training module; and

a classifier evaluation module.

23. A method for transcoding telecommunication signals, the method including producing a frame class, rate and classification feature parameters for a destination codec using one or more parameters provided in a bitstream derived from a source codec, the method comprising::

determining one or more input parameters from a bitstream outputted from a source codec;

inputting the one or more input parameters to a classification process;

processing the one or more input parameters in the classification process based upon information associated with the destination codec; and

outputting the frame class and a rate for use in the destination codec.

24. The method of claim 23 wherein the destination codec and the source codec are the same.

25. The method of claim 23 wherein the processing further comprises processing an external command in the classification process.

26. The method of claim 23 wherein processing further comprises processing past classification input parameters.

27. The method of claim 23 wherein processing further comprises processing past classification output parameters.

28. The method of claim 23 wherein processing further comprises processing past intermediate parameters within the classification process .

29. The method of claim 23 wherein the processing comprises a direct pass-through of one or more input parameters .

30. The method of claim 23 wherein the bit rate outputted from the source codec is associated with a number of bits to represent a single frame.

31. The method of claim 30 wherein the number of bits is at least 171 bits.

32. The method of claim 30 wherein the number of bits is at least 80 bits.

33. The method of claim 23 wherein the determining one or more input parameters from the source codec bitstream comprising:

determining a source code into component codes, the component codes being associated with the one or more input parameters;

processing the component codes using an unquantizing process to determine one or more of the input parameters; and

selecting one or more of the input parameters to produce the frame class and the classification feature parameters for input into the destination codec.

34. The method of claim 23 wherein the classification process comprises:

receiving one or more of the input parameters from the source codec;

classifying N parameters using M sub-classifiers of the classification process;

processing outputs of the M sub-classifiers to produce the rate and the frame class; and

providing the frame class and the rate to the destination codec.

35. The method of claim 33 wherein the component code is unquantized in accordance the one or more input parameters from the source codec to produce one or more intermediate speech parameters, the one or more intermediate speech parameters being selected from one or more features including a plurality of pitch gains, a plurality of pitch lags, a plurality of fixed codebook gains, a plurality of line spectral frequencies, and a bit rate

36. The method of claim 34 wherein each of the M sub-classifier is derived from a pattern classification process.

37. The method of claim 34 wherein each of the M sub classifiers is derived using a large training set of input speech parameters and desired output classes and rates.

38. The method of claim 34 wherein the classifier process is derived using a training process, the training process comprising:

processing the input speech with the source codec to derive one or more source intermediate parameters from the source codec;

processing the input speech with the destination codec to derive one or more destination intermediate parameters from the destination codec;

processing the source coded speech that has been processed through source codec with the destination codec;

deriving a bit rate and a frame classification selection from the destination codec;

correlating the source intermediate parameters from the source codec and the destination intermediate parameters from the destination codec; and

processing the correlated source intermediate parameters and the destination intermediate parameters using a training process to build the classifier process.

39. The method of claim 37 wherein the training set is derived from a process comprising:

processing one or more of the input parameters from the source codec;

processing the one or more input parameters with the destination codec;

processing the bit stream coded from the source codec with the destination codec;

deriving one or more intermediate parameters from the source codec and the destination codec;

retaining the bit rate and the frame class, the classification features parameters, and the rate from the destination codec;

correlating one or more parameters associated with the source codec to one or more parameters associated with the destination codec; and

processing information associated with the parameters for a classifier training process.

40. The method of claim 34 wherein each of the N subclassifiers is derived using an iterative training process, the training process comprising:

inputting to the classifier a training set of selected input speech parameters;

inputting to the classifier a training set of desired output parameters;

processing the selected input speech parameters to determine a predicated frame class and a rate;

setting one or more classification model boundaries;

selecting a misclassification cost function;

processing an error based upon the misclassification cost function between a predicted frame class and rate and a desired frame class and rate; and

returning to setting one or more classifier model boundaries based upon the error and desired output parameters.